SONY

CCD Color Video Camera

SSC-C350P/C370P

CCD-Black-and-white Video Camera

SSC-M350CE/M370CE

Operating Instructions Page 2

Before operating the unit, please read this manual thoroughly and retain it for future reference.

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English

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WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

For customers in the USA

Warning — This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Features

Overview of this manual
This manual covers the SSC-C350P, C370P, M350CE and M370CE.
The diffierences between them are shown in the table below.
The illustrations used in this manual are for the SSC-C350P/C370P.

The SSC-C350P/C370P/M350CE/M370CE video cameras use a 1/2-inch CCD (Charge Coupled Device).

	Picture elements (horizontal/vertical)	WHT BAL switch	LOCK button
Color video camera SSC-C350P	500 × 582	yes	yes
Color video camera SSC-C370P	752 × 582	yes	yes
Black-and-white video camera SSC-M350CE	500 × 582	no	no
Black-and-white video camera SSC-M370CE	752 × 582	no	no

The following are some of their features.

High sensitivity
These cameras give a clear picture even under very gloomy conditions.

CCD IRIS function
Even when a manual iris lens is fitted, the sensitivity is automatically adjusted according to the incident light level. This keeps the video signal at a suitable level.

Electronic shutter function
Eight shutter speeds are available, for various shooting conditions.

External synchronization
A number of cameras can be sychronized with the same reference synchronizing signal so that they can be controlled by a video switcher; you can switch from a camera to another without causing picture distortion on the monitor screen.

Features

Combined power cable (using YS-W130P/W230P camera adaptor)
A single 75-ohm coaxial cable (not supplied) connecting the camera to a YS-W130P/W230P camera adaptor (not supplied) carries the video output signal, as well as the power supply input and external synchronizing signal.

Auto-iris lenses
A C-mount auto-iris lens can be used, by connecting the lens cable with the plug supplied.

High resolution (for SSC-C370P/M370CE only)
The number of CCD picture elements (about 437,000) is sufficient to ensure high resolution.

Automatic adjustment of white balance (for SSC-C350P/C370P only)
The automatic adjustment mode stores the adjusted value; alternatively the automatic tracing mode responds to the lighting conditions to adjust the white balance automatically. Thus a picture with an appropriate color balance is always obtained.

Notes on Use

Power supply
This unit must always be operated with a 12 V DC power supply, or using the YS-W130P/W230P camera adaptor (not supplied).

Handling of the unit
Be careful not to spill water or other liquids on the unit, or to get combustible or metallic material inside the body. If used with foreign matter inside, the camera is liable to fail, or be a cause of fire or electric shock.

Operating and storage locations
Avoid shooting a very bright object (such as light fittings) for an extended period. Avoid operating or storing the unit in the following locations.
- Extremely hot or cold places (operating temperature −10°C to 50°C; 14°F to 122°F)
- Damp or dusty places
- Where it is exposed to rain
- Locations subject to strong vibration
- Close to generators of powerful electromagnetic radiation such as radio or TV transmitters

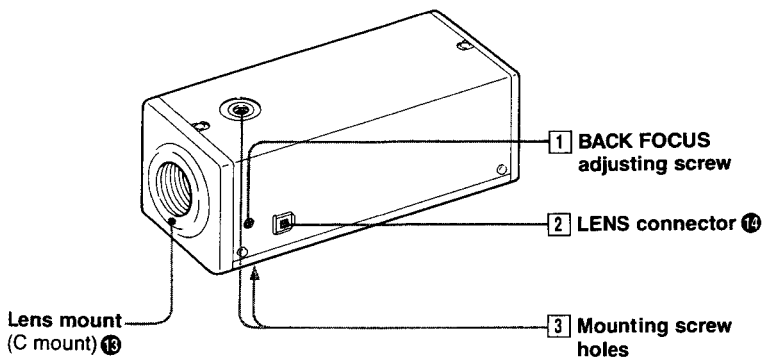
Care of the unit
- Remove dust or dirt on the surface of the lens or optical filter with a blower.
- Clean the body with a dry soft cloth. If it is very dirty, use a cloth dampened with a small quantity of neutral detergent, then wipe dry. Avoid the use of volatile solvents such as thinners, alcohol, benzene, and insecticides. They may damage the surface finish, or impair the operation of the camera.

In the event of any problems with the operation of the camera, contact your Sony service representative.

Location and Function of Parts and Controls

The numerals such as ⓭ in the illustrations indicate the page number on which this part is discussed.

Front and side



1 BACK FOCUS adjusting screw

The camera is shipped with the back focus adjusted to suit almost all lenses. If necessary, turn this screw with a screwdriver to adjust the focal plane. It has a self-locking mechanism, so once adjusted the focus will not drift.

2 LENS connector (4-pin)

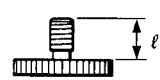
When using an auto-iris or zoom lens, replace the plug on the lens cable with the plug supplied with the camera, and plug into this connector.

3 Mounting screw holes

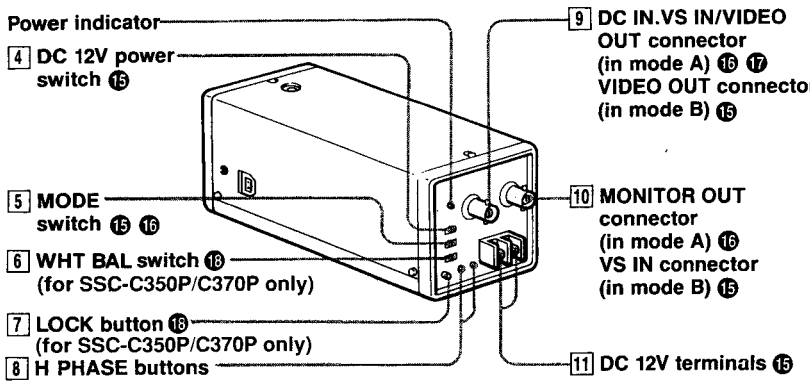
Use these holes to fix the camera to a mounting bracket or tripod. The mounting screw must be as follows.

1/4″ UNC (20 pitch)

ℓ : 4.5 mm ±0.2 mm (ISO standard), or
0.197″ (ASA standard)



Rear


Power indicator
4 DC 12V power switch ⑮
5 MODE switch ⑮ ⑯
6 WHT BAL switch ⑱ (for SSC-C350P/C370P only)
7 LOCK button ⑱ (for SSC-C350P/C370P only)
8 H PHASE buttons
9 DC IN.VS IN/VIDEO OUT connector (in mode A) ⑯ ⑰ VIDEO OUT connector (in mode B) ⑮
10 MONITOR OUT connector (in mode A) ⑯ VS IN connector (in mode B) ⑮
11 DC 12V terminals ⑮

4 DC 12V power switch

This turns the power on and off when using a 12 V DC power supply directly connected. It has no effect when the camera is used with a YS-W130P/W230P camera adaptor.

5 MODE switch

This switch determines the power supply mode.
Mode A: for use with a YS-W130P/W230P camera adaptor (not supplied).
Mode B: for use with a 12 V DC power supply connected to the terminals 11.
The video connectors 9 and 10 also have different functions depending on the mode setting.

[6] WHT BAL (white balance) switch (for SSC-C350P/C370P only)

This sets the white balance adjustment mode.

AWB (Automatic White Balance): When the LOCK button [7] is pressed, the white balance is automatically adjusted, and the setting is stored in memory. When the switch is set to this position the white balance always takes the previously stored value.

ATW (Automatic Tracing White Balance): The white balance is continuously adjusted to take account of variations in the incident light color temperature.

[7] LOCK button (for SSC-C350P/C370P only)

With the white balance switch [6] set to AWB, point the camera at a white object such as a white wall or piece of white paper so that the monitor is completely white, and press this button. The white balance value will be automatically adjusted and the current value stored.

[8] H PHASE (horizontal phase) buttons

Use these buttons to compensate for horizontal phase discrepancies which will occur when the camera is used with an extended cable. Use the tip of a ball-point pen or similar instrument to press the buttons, which are recessed.

[9] DC IN.VS IN/ VIDEO OUT connector (in mode A)/ VIDEO OUT connector (in mode B)

This is a BNC type coaxial connector to be used as follows depending on the setting of the MODE switch [5].

MODE setting	Input	Output	Connected to:
A	Power supply and external synchronizing signal	Video signal	YS-W130P/W230P camera adaptor
B	——	Video signal	Video monitor or switcher

[10] MONITOR OUT connector (in mode A)/VS IN connector (in mode B)

This is a BNC type coaxial connector to be used as follows depending on the setting of the MODE switch [5].

MODE setting	Input	Output	Connected to:
A	——	Video signal	Video monitor
B	External synchronizing signal	——	Synchronizing signal generator

Caution

When using the camera with a 12 V DC power supply directly conected, if the MODE switch [5] setting is left at A, then a video monitor connected to this connector will not get a correct video signal. In this case, set the MODE switch [5] to B, and connect the monitor to the VIDEO OUT connector [9].

[11] DC 12V terminals

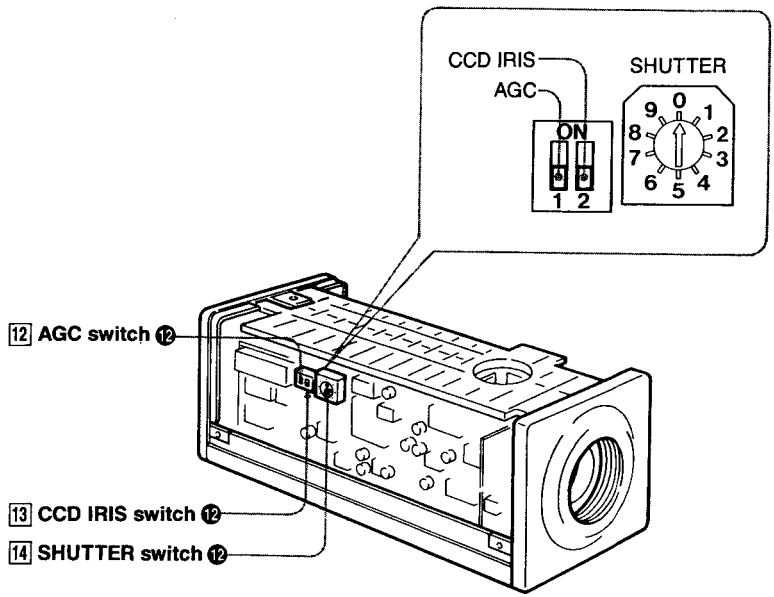
Connect these terminals to a 12 V DC power supply.

+: +12 V

−: ground

When using a 12 V DC supply connected directly to these terminals, always set the MODE switch [5] to B.

Internal switches



12 AGC switch

This switches the automatic gain control on or off.

13 CCD IRIS switch

This switches on and off the CCD IRIS function, which automatically adjusts the sensitivity according to the incident light conditions.

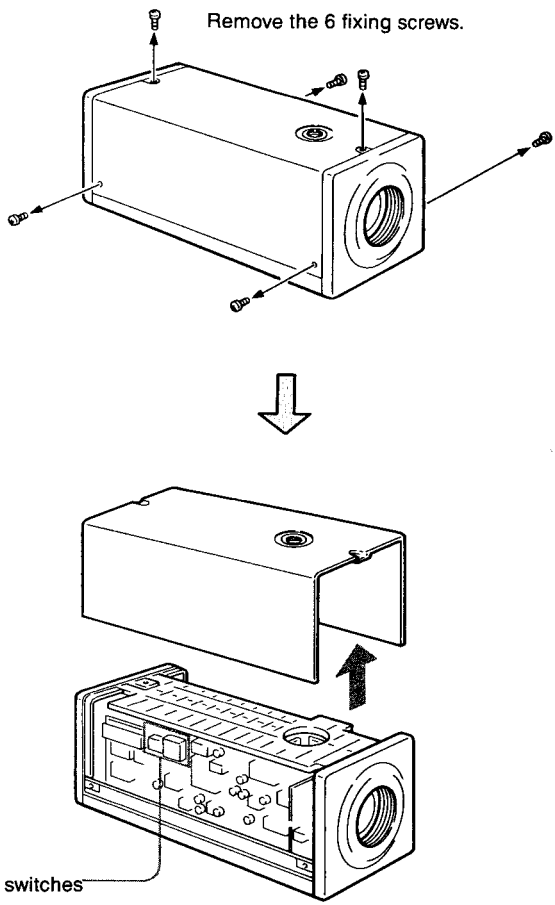
14 SHUTTER switch

This switch is effective when the CCD IRIS switch is off. It sets the shutter speed to any of eight fixed settings, from 1/50 to 1/10000 second.

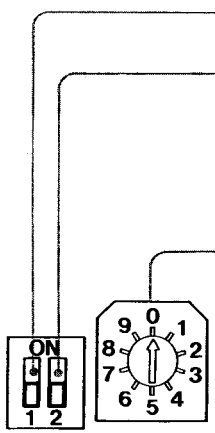
Internal Switch Settings

Before installing the camera, set the internal switches according to the following procedure.

1 Remove the upper cover from the camera body.



2 Set the switches according to the conditions in which the camera is to be used.



Switch	Settings	Factory setting
AGC	ON OFF (gain: 0 dB)	ON
CCD IRIS*	ON OFF	C350P/ C370P : OFF M350CE/ M370CE : ON
SHUTTER	(only effective when CCD IRIS is off) 0: 1/50 s 1: 1/120 s 2: 1/250 s 3: 1/500 s 4: 1/1000 s 5: 1/2000 s 6: 1/4000 s 7: 1/10000 s	0

3 Replace the upper cover on the camera body.

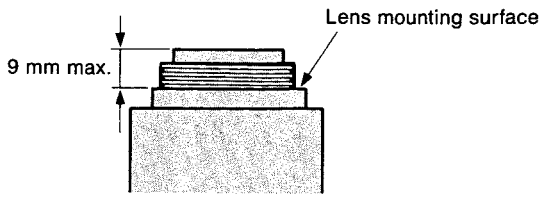
* CCD IRIS function. When using a manual iris lens, this function automatically adjusts the shutter speed to maintain a suitable exposure level. Turn this switch off when using an auto-iris lens.

Note for SSC-C350P/C370P

The CCD IRIS function may cause unstable color reproduction (slow color changes) to an object shot under fluorescent lamps. If the color changes are too extreme for the picture to be used, turn the CCD IRIS function off and use an auto-iris lens.

Mounting the Lens

Suitable lenses
The lens must be a C mount type, and the screw thread must not project more than 9 mm ($^3/_8$ inches) from the lens mounting surface.

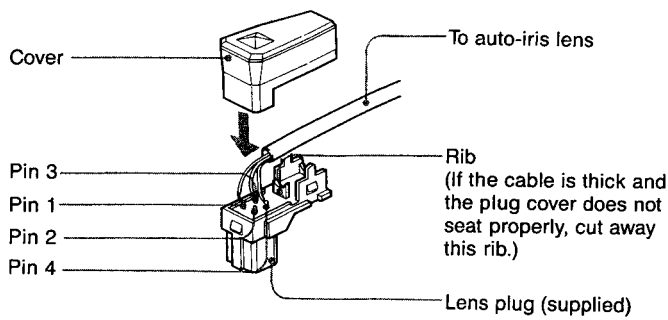


This camera uses a 1/2-inch CCD, so the lens should be for use with this size of CCD. In particular, if used with a lens for a 2/3-inch CCD the angle of view will be different.

Plug fitting for an auto-iris lens
The camera is supplied with a plug to fit the LENS connector. To connect an auto-iris lens, first replace the plug on the lens cable with the plug supplied.

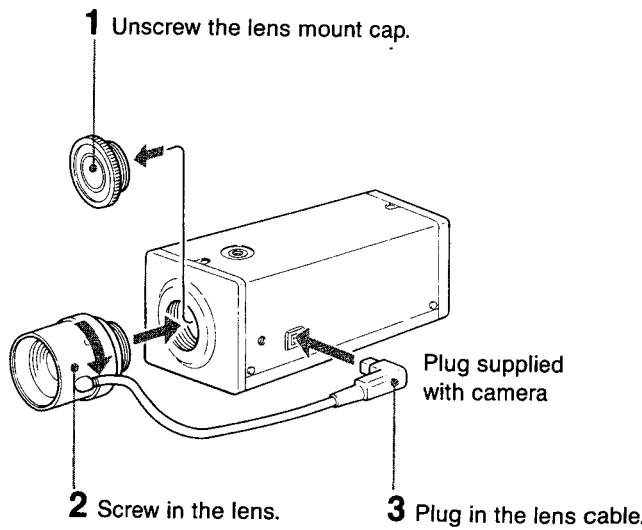
1 Solder the lens cable wires to the pins on the plug supplied; apply heat after putting heat shrink sleeving on the wires. The pin assignment is as follows.
Pin 1: Power supply (+9 V DC, 50 mA)
Pin 2: Unused
Pin 3: Video signal output (for auto-iris control; 0.7 Vp-p, 40 k ohms, no synchronizing signal)
Pin 4: Ground
(Refer to the operation manual for the lens to determine the cable color coding.)

2 Put the cover on the plug.



Fitting the lens

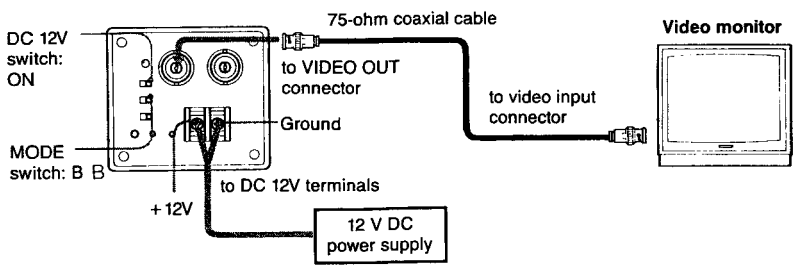
When using an auto-iris lens, fit it as follows. For a manual iris lens, omit step **3**.



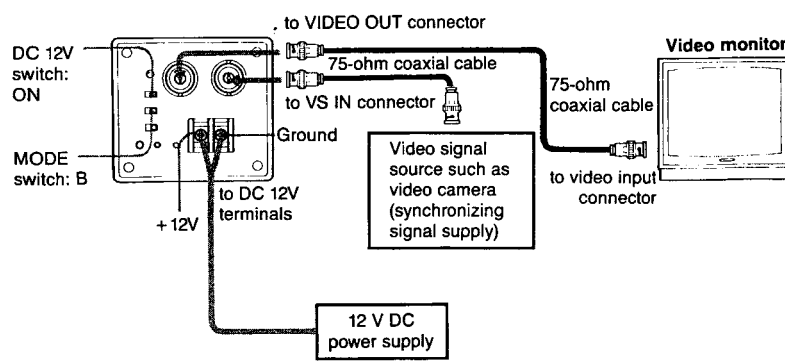
Connecting to a 12 V DC Power Supply

Set the MODE switch to B, connect the power supply, then turn the DC 12V switch on.

Operating with an internal synchronizing signal



Operating with an external synchronizing signal



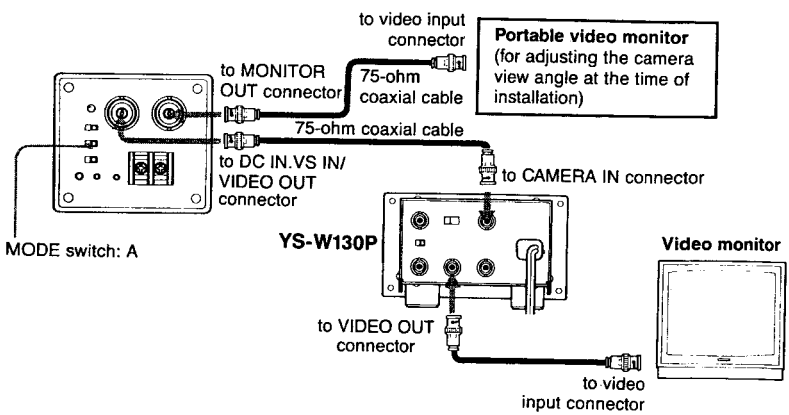
Connecting to a YS-W130P Camera Adaptor (Not Supplied) (Combined Power Cable)

The following table gives the maximum lengths of the 75-ohm coaxial cable.

Cable type	RG-59B/U (3C-2V)	RG-6A/U (5C-2V)	RG-11A/U (7C-2V)
Maximum cable length	300 m (984 ft)	500 m (1640 ft)	600 m (1968 ft)

Set the MODE switch to A, make the connections, then turn on the POWER switch on the YS-W130P camera adaptor.

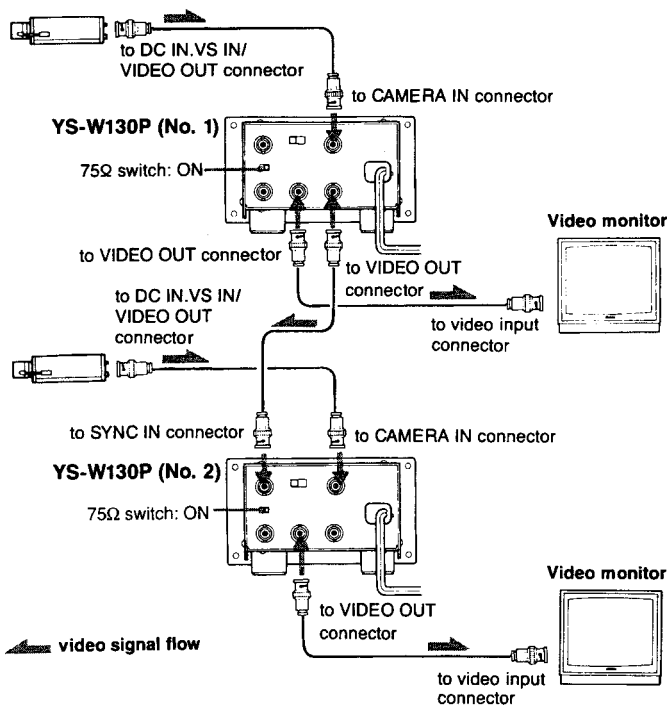
Using a single camera


to video input connector
Portable video monitor (for adjusting the camera view angle at the time of installation)
to MONITOR OUT connector
75-ohm coaxial cable
75-ohm coaxial cable
to DC IN.VS IN/ VIDEO OUT connector
to CAMERA IN connector
MODE switch: A
YS-W130P
Video monitor
to VIDEO OUT connector
to video input connector

Using a number of synchronized cameras

The output video signal of one camera can be used for synchronizing the other cameras. The connections for a two-camera system are illustrated below.

For synchronizing more than two cameras, you are recommended to use a YS-W230P camera adaptor. You can connect up to four cameras to a single YS-W230P.



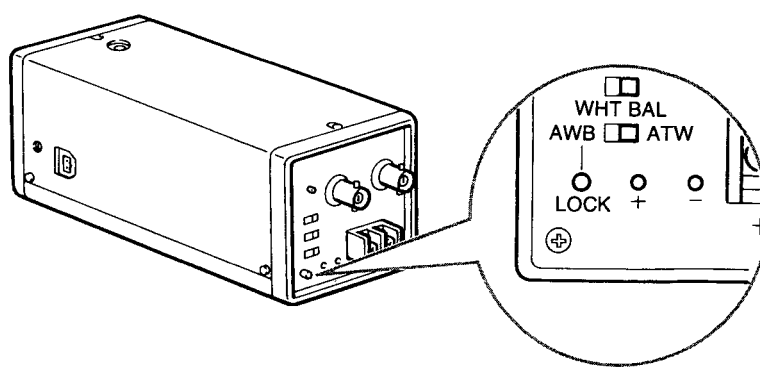
White Balance Adjustment
(for SSC-C350P/C370P only)

Only the SSC-C350P and SSC-C370P color video cameras require this adjustment.

After fitting the lens, and making all the installation connections, use a monitor to check the picture and set the white balance as described below. Note that the unit is shipped with the white balance switch set to ATW.

AWB (Automatic White Balance) mode:
This mode is appropriate when lighting conditions are more or less constant.
Point the camera at a white object so that the monitor screen is as far as possible all white, then press the LOCK button. This will calculate the current white balance setting and store it indefinitely in memory. Thus there is no need to readjust the white balance after the power is turned off and on again.

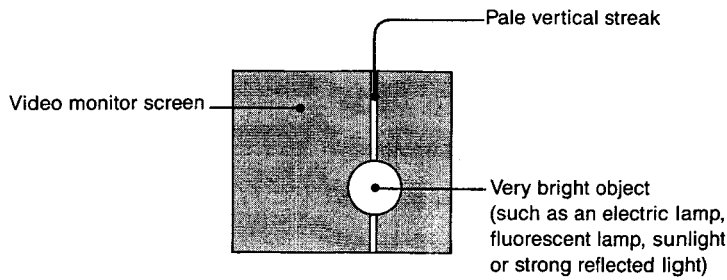
ATW (Automatic Tracing White Balance) mode:
In this mode the camera continuously adjusts the white balance according to the changing lighting conditions.



CCD Characteristics

The following conditions that may be observed when using a CCD camera are not associated with any fault of the camera.

Vertical smear
This phenomenon occurs when shooting a very bright object.



Patterned noise
This is a fixed pattern which may appear over the entire monitor screen when the camera is operated at a high temperature.

Wavy picture
When shooting stripes, straight lines, or similar patterns, the image on the screen may appear jagged.

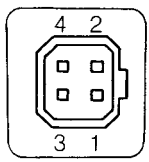
Principal Specifications

Imaging system

Pickup device	Inter-line transfer type CCD
Effective picture elements	SSC-C350P/M350CE: 500 × 582 (horizontal/vertical) SSC-C370P/M370CE: 752 × 582 (horizontal/vertical)
Sensing area	6.3 × 4.7 mm ($^1/_4$ × $^3/_{16}$ inches)

Optical system and miscellaneous

Lens mount	C mount
Signal system	SSC-C350P/C370P: PAL color system SSC-M350CE/M370CE: CCIR standard
Scanning system	625 lines, 2:1 interlace, 25 frames per second
Synchronization	Internal or external (automatic switching)
External synchronizing signal input	VS (sync level 0.3 Vp-p, 75 ohms)
Horizontal resolution	SSC-C350P: 330 TV lines SSC-C370P: 470 TV lines SSC-M350CE: 380 TV lines SSC-M370CE: 570 TV lines
Minimum illumination	SSC-C350P/C370P: 2.5 lx at F/1.2 (AGC on) SSC-M350CE/M370CE: 0.3 lx at F/1.2 (AGC on)
Video output	1.0 Vp-p, 75 ohms, sync negative
Video S/N ratio	SSC-C350P: 46 dB minimum (AGC off) SSC-C370P: 48 dB minimum (AGC off) SSC-M350CE: 48 dB minimum (AGC off) SSC-M370CE: 50 dB minimum (AGC off)
Electronic shutter	8 settings: 1/50 s, 1/120 s, 1/250 s, 1/500 s, 1/1000 s, 1/2000 s, 1/4000 s, 1/10000 s
White balance (for SSC-C350P/C370P only)	AWB (Automatic White Balance) and ATW (Automatic Tracing White Balance) switchable
AGC	Switchable on/off
Input and output connectors	DV 12V terminals VIDEO OUT (when using combined power cable: DC IN.VS IN/VIDEO OUT) BNC type VS IN (when using combined power cable: MONITOR OUT) BNC type LENS: 4-pin connector (pin assignment as follows)



Side of camera body

Pin	Signal
1	Power supply (9 V DC, 50 mA)
2	Unused
3	Video output signal for lens (0.7 Vp-p, no synchronization signal)
4	Ground

Power requirements
For 12 V DC supply: 12 V DC ±10%
For YS-W130P/W230P camera adaptor: 24 V DC ±5V

Power consumption
For 12 V DC supply: SSC-C350P: 2.4 W
SSC-C370P: 3.1 W
SSC-M350CE: 2.3 W
SSC-M370CE: 2.8 W
For YS-W130P/W230P camera adaptor:
SSC-C350P: 3.5 W
SSC-C370P: 4.3 W
SSC-M350CE: 3.4 W
SSC-M370CE: 4.0 W

Operating temperature –10°C to 50°C (14°F to 122°F)

Storage temperature –40°C to 60°C (–40°F to 140°F)

Relative humidity (operating) 20% to 80%

Relative humidity (storage) 20% to 95%

Shock resistance 70 G (686.5 m/s^2)

External dimensions (w/h/d) 64 × 57 × 155 mm ($2^5/_8 \times 2^1/_4 \times 6^1/_8$ inches) (excluding external projections)

Weight 660 g approx. (1 lb 7 oz)

Accessories supplied
Lens mount cap
4-pin plug for lens cable
operation manual

Recommended equipment
YS-W130P/W230P camera adaptor

Design and specifications are subject to change without notice.